Supporting information

Microvessel-on-chip fabrication for *in vitro* modeling of nanomedicine transport

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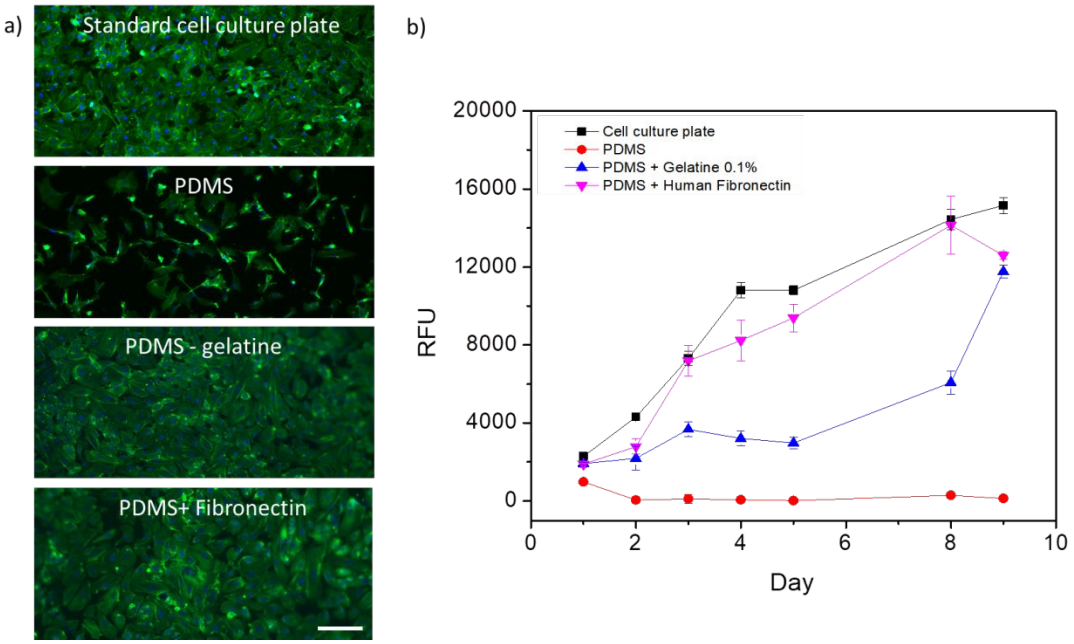

***Figure S1**: HUVECs adhesion and proliferation assays. a) Fluorescence images of the HUVECs adhesion on a standard cell culture plate, on pristine PDMS and on a PDMS substrate coated with 0.1% Gelatin or with 0,05% human fibronectin to promote cell adhesion (Scale bar = 100 µm). b) Proliferation rate of HUVECs on a cell culture plate or on to PDMS (non-treated, treated with fibronectin or treated with gelatin). The substrate treated with fibronectin led to a higher adhesion and proliferation rate in comparison to the non-treated PDMS surface and similar to the standard cell culture plate.*

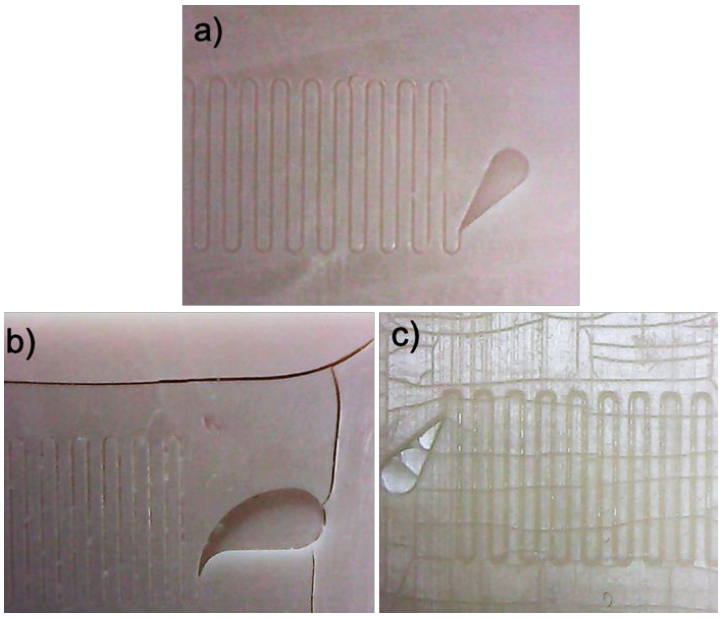

Figure S2: a) DLP- SLA 3D printed mold. *b-c) Mold cracks produced by the thermal imprint process when channels are perpendicular to the 3D printing direction.*

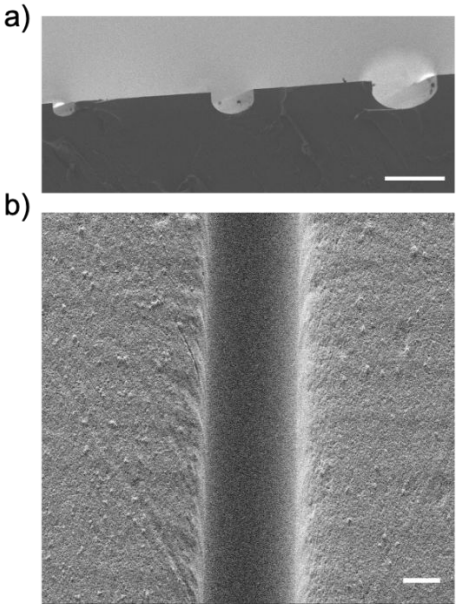

Figure S3: Replicated *PDMS microchannel from an intermediate polymer stamp obtained by thermal nanoimprint from a silicon micro machined mold showing a) cross section and b) top view. Scale bar = 100 µm.*

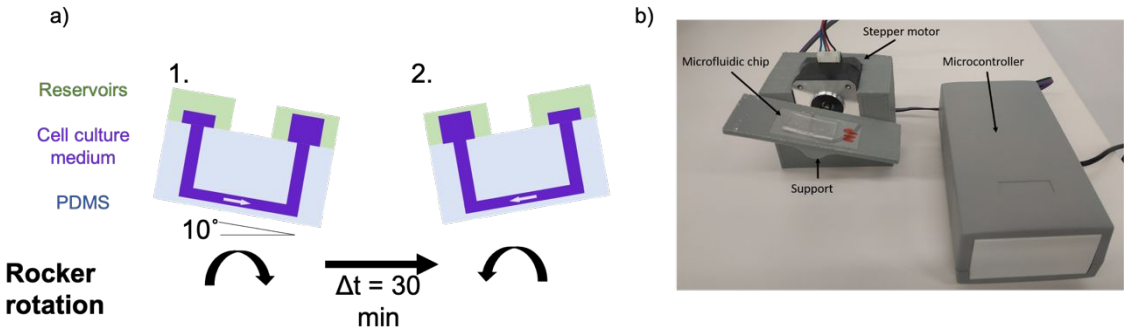

***Figure S4**: Principle of operation of the mini rocker system for flushing cell media during cell culture inside the microchannels. a) Schematic of the working principle and b) photography of the rocker station constructed including a stepper motor, a platform to place the microfluidic device and a microcontroller for programing the rotation angle and the step time.*

The principle of operation of the mini rocker system is based on hydrostatic pressure leveling. For this, reservoirs are connected to the inlet and outlet of the chip and filled with cell culture media. By flipping the chip at a given angle, it is then possible to flush the microchannel with fresh medium while the HUVECs are attaching and spreading on to the channel surface.
The microcontroller connected to the step motor, allows choosing the angle (10° in all experiments) and the step time between each inclination cycle, in this case, the chip flips every 5 minutes.

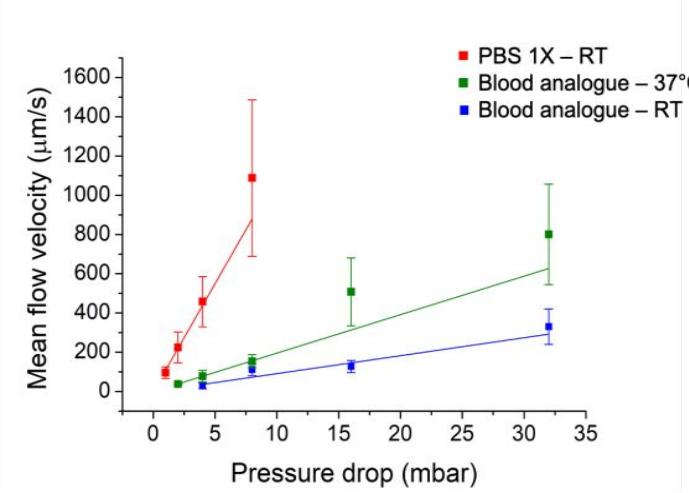

***Figure S5**: Graph illustrating flow velocity versus pressure drop for the blood analogue solution in a 30 µm radius semi-circular channel at 37°C (green) and comparison with the flow velocity at room temperature (blue) and that of a PBS 1X solution (red).*